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E. P. MEINECKE, *Principal Pathologist*
Division of Forest Pathology, Bureau of Plant Industry
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A camp ground consists of an area set aside and reserved for the single purpose of allowing people to spend some time in the open, away from cities and towns, in forest and woodland. The choice of the camping place was formerly left to the visitors themselves, but with the immense increase of campers in National Forests and National Parks it became necessary, for reasons of sanitation and because of the steadily and alarmingly increasing danger of forest fires escaping from camp fires, to restrict camping to definitely chosen and designated camp grounds, so that the campers who formerly were scattered through the forest are now concentrated in large numbers in relatively small areas. This concentration, while it eliminated the dangers of stream pollution and of uncontrolled forest fires, brought new problems of administration. The effects of the very intensive use of the area, day after day and year after year, by a relatively large number of people, began to appear in slow but constant changes in the original cover of vegetation. The enormous increase in the number of automobiles driven into, and parked in, the camps intensified the effects of heavy use to such a degree that first the ground cover, then shrubs and young trees, and finally larger shade-giving trees began to die, and that many camp grounds finally became useless and had to be abandoned because they no longer offered the pleasant surroundings which the visitor seeks in camping.⁽¹⁾ This driving of automobiles into the camp itself is by far the most damaging element. The soil surface becomes compacted and hard, and the plant roots are injured. The automobile, in turning and moving about among the trees and shrubs, causes a great deal of mechanical injury, and at last a point is reached where the cumulative effects on plant life become so great that first suffering and then death ensues.

A further consequence of concentrated camping is the accumulation of ash heaps from camp and cooking fires. Apart from the unsightliness and dirt, these ashes have an injurious effect on plant life. The ash lye which the rains wash into the soil in high concentration is poisonous to plants. The roots of shrubs and trees under the ash heaps are seriously injured and often killed.

(1) E. P. Meinecke. A Camp Ground Policy. U. S. Forest Service, Ogden, Utah, 1932.

Since most campers prefer to choose their own spot for the building of a fire, the open spaces within a camp are soon covered with the remains of old fires which after a while are covered with fallen leaves, dust and earth. The injurious effect, however, goes on until the ashes are leached out. The damage to the roots is intensified when it is added to the direct injury of the hot flames of the fire to the branches and foliage of near-by trees.

The diminishing value of many designated areas for camping in pleasant surroundings has reached a point where it becomes necessary to adjust their use to the changing conditions, in order to prevent further damage and to protect the camps from destruction. Instead of single families or small groups occupying a camp, as in former days, many people now congregate in one area, and a community of a temporary character is formed, just as in a hotel a kind of community life develops, though the guests may be changing daily. Certain regulatory restrictions become inevitable in order to safeguard the rights of all the guests as well as those of the hotel or camp. The institution must go on uninjured to be ready at all times for new guests, whether it is a private hotel run for profit or a Government establishment free to all the people.

These regulatory restrictions must be drawn with greatest care. They must be adequate to obtain the desired results of protection and permanence of the camp grounds. At the same time they should encroach as little as possible upon that legitimate degree of personal liberty which the camper has a right to enjoy. The limits of liberty of the individual are drawn by the respect for the rights of others, including those of the Government, which, in turn, is obligated to protect the interests of all and to insure the permanence of the camps for the use of coming generations.

The average citizen clearly understands and recognizes the necessity of his own submission to legitimate regulation in the interest of the social group to which he belongs. He wants orderliness and the feeling of safety in his own pursuits, and he insists on a similar compliance, on the part of others, with the simple rules of give and take that are expressed in the regulatory laws governing community life. In his city or town he is under regulation from morning until night. When he goes camping, however, he seeks at least an approach to the free and unhampered life of the pioneer. All day long he roams in the forest, without restrictions except those of common sense. As soon as he enters camp he steps into a primitive community, and adjustments to his neighbors become necessary which jar upon his ideal of absolute liberty. The additional restrictions imposed upon him in the interest of orderly community life lead him right back to the very conditions of city narrowness which he has sought to escape, unless they are drawn so unob-

trusively that he hardly recognizes them as such.

It is of the greatest importance that the directions and instructions which the camp authority wishes to convey to the camper be logical and based on common sense, and that the means through which the camper is informed be carefully chosen so as to avoid an unpleasant reaction in his mind. He will automatically keep driving on a well-made road, and there is no need to admonish him to do so. If he finds a well-constructed cooking stove, conveniently placed, he will not go to the trouble of building one for himself. With all this, it must not be forgotten that even the best of law-abiding citizens, when he is torn loose from the accustomed and accepted restrictions of town life, has some difficulty in adjusting himself to his new freedom. He does not instinctively know what is permitted and what he is expected to avoid. He will drive on the camp road, but there is no self-apparent reason why he should not get off the road into the woods if he so desires. The erection of signboards will not prevent it, but physical obstacles, properly placed, will automatically keep him on the road. Large boulders or logs or ditches convey to him the unwritten information that the camp administration desires him to stay on the road and that automobiles are to be kept out of the wooded camping areas. The art of distributing such heavy obstacles where nature has not provided them lies in the automatic and immediate conveyance of the instruction to the driver and in avoiding at the same time the impression of artificiality.

The concentration of tourists in camps is a necessary restrictive regulation. It cannot be changed, but undesirable consequences can be mitigated or avoided. People will continue to move about on a relatively small area, to harden the soil and to tramp out the ground cover. But the introduction of order into the campsite will tend to direct the travel into more or less definite channels and paths, just as in a room certain paths develop which are more heavily used than other parts of the room.

Since the damaging effect of the automobiles by far exceeds that of moving people, it becomes imperative to fix it in place in such a way that it serves its purpose within the camp but occupies the least space. That is achieved by allotting for it an open-air garage or a parking spur leading off the road and extending a short ways into the campsite. The second objectionable feature is the movable fire and cooking place. Every campsite must, in the long run, be furnished with a definite location for the cooking fire, either plainly indicated or provided with a built-up grid or cook stove. Wood fires within the campsite must be strictly confined to these designated emplacements. The fixation of the car and of the cooking fire naturally governs the choice of the proper place for the table, which should be fixed, if it is at

all possible. The location of the tent will follow logically from that of the other camp features. The use of the tent has the least objectionable consequences for the permanence of the campsite.

In the order of importance, the fixation of the car in its parking spur comes first, next that of the fireplace, and last that of the table.

CAMP PLANNING

Camp planning combines two main objectives, the fullest utilization of the limited space compatible with increased convenience and comfort of the camper, and the permanent protection of the woodland character of the camp ground. In Parks and Forests, the areas set aside for camping are chosen with regard to their attractiveness, which lies mainly in the type of trees, shrubs and other green vegetation on the ground and their distribution. A plan which aims at full utilization of the space exclusively is apt to overlook the fact that the camper is not attracted by roads and bare lots but by the vegetation which affords him shade and recreation in the green forest.

Utilization of space must, therefore, be subordinate to, and governed by, the type and distribution of plant life on the ground. The plan must be adapted and adjusted to the vegetation. It aims at the conversion of a wild forest area into a pleasant and comfortable camp ground.

The natural, untouched vegetation in the forest is irregularly and unevenly distributed so that no two camping areas are alike. Each one has to be planned and arranged on its own merits. A similar variety exists with regard to the composition of the forest cover. At lower elevations wide-spreading oaks, with shrubs, make excellent camps. Higher up there are pines, firs and cedars, with scattered broad-leaf trees in the openings, and at still greater elevations the camp grounds may be located in aspen groves and among subalpine pines. The varying sizes of the trees and shrubs, their mass effects, and even color and different shades of green, have a strong bearing on the character of pleasantness and power of attraction. Further, not all types of vegetation are equally susceptible and sensitive to invasion by man. The large old oaks of the lower country, with the broad open stretches of grass under and between them, are less endangered by public use than are the dense groves of short aspens and high-altitude pines of the mountains. Even a road slashed through the aspen and pine thickets upsets the natural balance of life on their borders, and when openings for campsites are cut into the groves the entire physiological setup under which the trees, with all the many associated plants, have grown into a natural association is profoundly disturbed. The sudden letting in of strong sunlight and of winds in itself effects changes from which the trees suffer and to which they have difficulty in adjusting themselves.

When man moves into the camp and adds to the handicaps by trampling out the grass and lower plants, of hardening and compacting the soil, of scattering ashes and of scorching the foliage with his wood camp fire, the limit of toleration may be reached and overstepped.

Camp planning is futile, and even dangerous, if it does not give the most careful consideration to the physical makeup of the area to be regulated. There exists an intimate relationship between vegetation and soil, and the treatment which may perfectly suit one type of soil will prove disastrous in camps with another type. Vegetation growing in rich ground with evenly maintained moisture is far less sensitive to moderate use than are plants which are barely able to support themselves in poor, gravelly soils. The type and distribution of the vegetation on the ground determine the type and details of the plan which is to serve it best.

Into every plan for camp ground regulation there enter two important elements which are fundamental for success or failure, and which, once they are carried from the provisional plan into execution on the ground, can no longer be corrected. They are the road system and the subdivision of the whole camp ground into individual sites or lots.

THE ROAD SYSTEM

The individual campsites within the camp ground area must be directly accessible by roads. These service roads are permanent features. They are expensive to build, and errors in judgment in laying them out cannot easily be remedied. The road plan should, therefore, be very carefully considered before any actual improvement work is done. The road has its definite beginning, where it enters the grounds, and it must again lead out of them. The fixed starting point determines at least part of the general direction of the road and therefore influences strongly the whole plan of subdivision, particularly in smaller camp grounds. Larger ones offer greater freedom in planning once the camp ground is entered. But always the road must lead out again to a logical point.

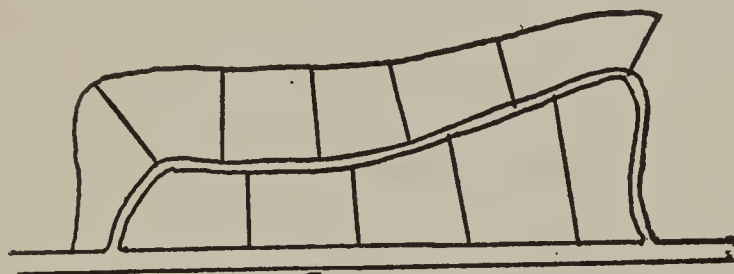
The tracing of the roads depends immediately upon the subdivision into campsites or lots. The determination of the legitimate standard size of the lots precedes necessarily the planning of the roads which are to serve them.

There can be no doubt that the one-way road system is the most desirable and serviceable, and that it should be adopted wherever possible within the camp grounds. It restrains fast driving, cuts down the dust nuisance and saves a great deal of space that may more profitably be thrown into actual camping or into screens to insure a higher degree of privacy in the camps. The use of a narrow road in two directions invariably leads to its broadening and to disorder. There will be cases where the principle cannot be carried

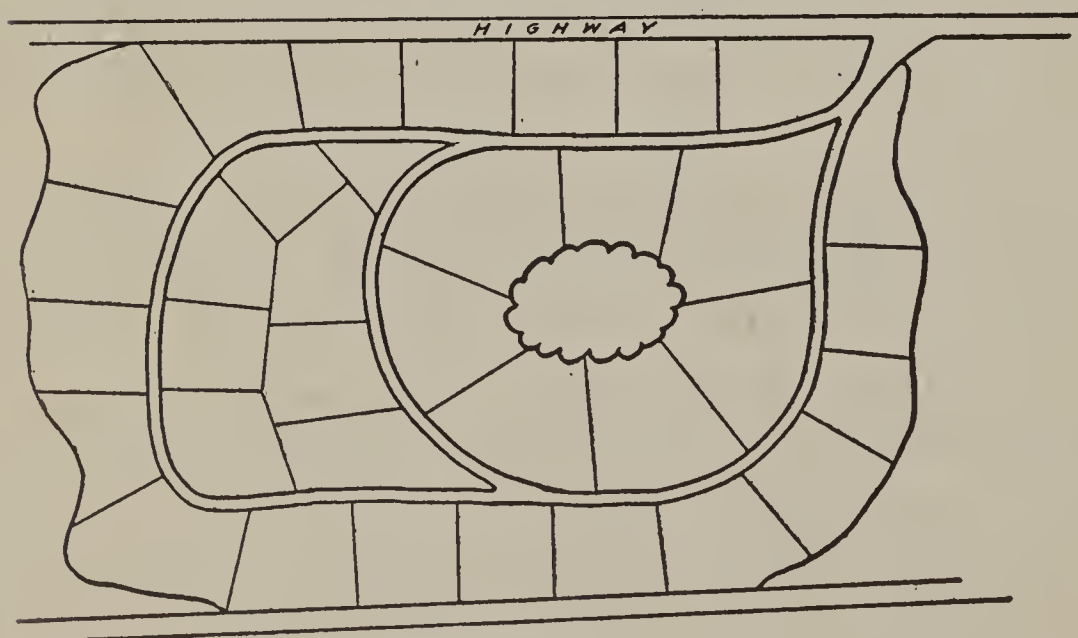
through without modification. Even then it should rarely be necessary to carry a two-way road far into the camp ground.

The camp service road has only one objective, namely, to make each individual campsite or lot easily accessible. It can, therefore, serve only one tier of lots on each side. In the camp community there are no back lots. Spur roads leading to them would be too long, and one would have to provide for turning space on the back lot, with resulting waste of valuable space. The ideal road system is one which utilizes the available space in such a manner that it directly reaches every campsite.

The best utilization of the whole camp ground is secured by a one-way road which is lined on both sides by campsites. In the simplest case, that of a relatively narrow strip, the road leads through its middle, serving lots on either side. On larger grounds the road may swing back at the end to serve another single or double tier, parallel to the first. In broader camp grounds of rectangular or square outline connecting roads break up the area into smaller units, each laid out in individual lots. These connecting roads run back into the main road at such an angle that the driver is forced to continue in the one direction, and large rocks or other obstacles are placed so that he will not attempt to turn against the one-way travel. (Figures 1 and 2 give examples of subdivisions and road systems.) The distance between two par-



*Fig. 1.
Subdivision And Service Road in Small Camp Ground.*



*Fig. 2.
Subdivision And Service Road in Larger Camp Grounds.*

alleling connecting roads is determined by the size, and more particularly by the depth, of the lots making up the two tiers lying back to back between the roads.

In older camp grounds the road generally developed out of the haphazard tracks of vehicles, driven without preconceived plan by the campers themselves, and the camps were fitted in the same aimless way into the space left between the tracks. The resulting waste of space is avoided in the planned camp ground. In the reconstruction of older camp grounds it is frequently necessary to obliterate the traces of the old roads completely by digging them up or by ploughing so that the hard roadbed may again be brought back to natural conditions and, in time, may become suitable for vegetation. The road system is far easier to plan in newly laid out camp grounds, once the standard size of the campsites has been established and a tentative plan for the subdivision has been laid down. In this plan the utilitarian features are considered first. The camp must be comfortable and usable. Next comes the factor of pleasantness. Each camp should have the advantages of shade and more or less privacy against adjacent campsites. This seclusion is provided for by a neutral zone left between adjoining sites. Preferably, it will consist of a strip of green shrubs or young trees, or, where these are absent, of a correspondingly broader belt of open land. A similar neutral zone of green should protect the camp from the dust and noise of the road. Where this is not available the lot should be set farther back from the road. The distance from one road to the next one paralleling it equals, therefore, the widths of the two campsites lying back to back plus the widths of the neutral zones between the two and between each camp and the road. It is obvious that the road system cannot be laid out before these distances are known, but it is just as clear that the planning of campsites without any regard to the existing physical conditions will lead to trouble. The road must be fairly level and must maintain its standard width. If the arrangement of the campsites forces it into steep ground or into large boulders or rock outcroppings the expense involved in road building becomes prohibitive, and the entire scheme and pattern of the camp ground must be altered to fit the case.

Very few lots will be rectangular in shape. They are of all conceivable forms, some roundish, others elongated, and they are fitted together irregularly as in a picture puzzle. In few instances will the distance from road to road be the same, so that only in rare cases will the roads follow a straight line.

SUBDIVISION OF THE CAMP GROUND INTO LOTS OR INDIVIDUAL CAMPSITES

A given piece of land is to be broken up into smaller units, each one

offering more or less the same advantages as the others. Where that is impossible the advantages and the less desirable features should be distributed as evenly as possible. People go camping in order to enjoy certain pleasures they do not find at home, and they are willing to pay for them, up to a certain degree, the price of inconvenience. They want, above all, shady trees and green shrubs, reasonable protection from dust and wind, and fairly level ground to pitch their tent on, and to go about their simple housekeeping. They want water near by, but object to being located too close as well as too far from garbage pits and comfort stations. They desire a certain degree of privacy obtained either by a screen of shrubs or young timber against neighboring campsites and the road or by a broader belt of unoccupied ground. Land suitable for camping is by its nature more or less covered by irregularly distributed timber or brush, and the art of camp planning consists in fitting the sites into this vegetation as it is found on the ground. Each site presents its own problems of outlining and arrangement in order to make the best of existing conditions. The only changes that can be made immediately are negative, that is, they consist in the removal of trees, shrubs or large rocks to make room for essential camp features, such as parking spur, fireplace, table and tent. Nothing can be added at the time of planning. Planting is expensive, and its effects do not become visible for years. The greatest care must, therefore, be exercised in the choice of trees or shrubs to be removed. An error in judgment cannot easily be rectified. This kind of work, which requires careful weighing and a good deal of creative imagination, should under no circumstances be left to untrained men. Each tree or shrub to be cut should be designated, and the cutting should be strictly confined to these plants. No greater mistake can be made than to cut out all lower growth indiscriminately. A screen of shrubs or young reproduction between camps is a valuable asset, and its preservation must be made an integral part of any subdivision plan.

Since shade is one of the most important requirements, it becomes essential in subdivision that the movement of the sun over the course of the day be ascertained with regard to those camp fixtures where shade is most needed. Most campers like the full morning sun on tent, fireplace and breakfast table; but later in the day, and especially for noon and afternoon cooking and eating, protection from the hot sun is necessary. The dinner table must stand in the shade during the middle of the day and in the afternoon, and if it is at all possible, the cooking fire should have similar protection. Next in importance comes the protection of the automobile, and last in line that of the tent, which, as a rule, is little used during daytime.

The direction of the prevailing winds is an important factor in laying out the camping sites. Where winds are blowing strong the campsite should

have the protection of trees and high shrubs. The direction of the prevailing winds also influences the emplacement of the fireplace and the position of the smokepipe to insure favorable draft conditions. The smoke should not be allowed to drift on the table or onto the car.

The average family needs a certain amount of space for comfortable camping, but there is obviously a limit to the space that may be allotted to each. Not infrequently, restriction in camping space may be compensated by advantages in better shade, level ground and greater privacy, but for each camp ground a standard size of individual lots or sites must prevail. The same camp ground should not contain disproportionately large and small campsites. Obviously, there can be no hard-and-fast rule. Where little space is available and demands are heavy the individual lots or sites will necessarily be closer together, and proper utilization demands that they be kept smaller than on large camp grounds with relatively little use. When screening, consisting of young timber or thick brush, is adequate the campsites may be moved more closely together than in open timber with little natural screening.

The camper is really furnished with a roofless cabin in which the essential commodities are the garage, the kitchen stove, the dining table and the sleeping quarters, with enough space to move around without inconvenience. The trees and shrubs surrounding it form the walls. And just as in a real cabin, all these features stand in a certain definite relation to each other. The car carries the bedding, but this is generally removed in one, or in very few, bundles to the tent, involving a single transfer upon arrival and another one upon departure. The distance from car to sleeping place is, therefore, not of great importance. But the car in its parking spur is also the larder where the camper keeps his provisions. It must, therefore, not be too far removed from the cooking place. Provisions are, as a rule, not carried in a single package, and in camp housekeeping many trips back and forth from car to stove and table are necessary.

The actual space occupied by the essential pieces of furniture in the roofless cabin, while varying somewhat, can be figured fairly closely. The average car measures about 5 feet 4 inches by 18 feet. For the moving car, however, 8 feet should be allowed. The standard stove concrete base is 52 inches by 22 inches. The table top, standard, measures 5 feet by 3 feet, and the space occupied by a table with attached benches is 5 feet by 5 feet. Tents average 10 feet by 12 feet, with pegging 12 feet by 16 feet.

To these measurements must be added the space needed for the use of the fixtures. All parts of the car are readily accessible if the dimensions of the parking spur are planned for convenience. The tent is approached only at its entrance. The other sides are not used. But the table and the stove need plenty

of space. The cook must have room to move around the stove, and there must be some space for piling firewood and placing a box or two for cooking staples. The family gathers at the table in full strength three times a day, and needs plenty of room in sitting down to, and leaving, the meals.

These requirements applied to the character of the area, its topography, the distribution of trees and shrubs, rockiness of the ground, shade, screening from the road and neighboring camps, intensity and type of use should govern the size of the camp lot, and it will not be difficult to set up, for each camp ground, a certain standard of dimensions of campsites which makes for the best utilization and an even distribution of advantages and disadvantages.

PLANNING THE INDIVIDUAL CAMPSITE

Four main parts make up the individual campsite—the parking spur, the cooking stove, the table, and the tent. The car is not allowed to move outside of the road, and is confined to a parking spur which branches off at a convenient angle from the road. On leaving, the car backs into the road and goes on in the prescribed direction. The parking spur is clearly defined, and obstacles on the ground, such as larger trees, boulders or logs, indicate plainly its outlines. This confinement immediately introduces a system of order which affects the rest of the campsite. Another feature which, in the interest of safety and order, is definitely fixed is the cooking stove. It must be so placed that adjoining vegetation is not endangered, and that the smoke does not drift onto the car or interfere with the use of table or tent. There exists, then, a definite relation between the emplacement of the cooking stove, the parking spur and the other elements of the camp. Hence, the choice of the parking spur is contingent upon the position chosen for the cooking stove, and vice versa. One cannot be chosen without due regard to the other.

Trails develop in the use of the campsite by the campers themselves as they walk to and fro from one feature to the other. There is the entrance to the camp, from the car, leading to fire, table and tent. There is a definite trail from the front of the tent to car, fire and table; but the most used trail runs between cook stove and table. In the ground plan of the site these trails play an important part. Each feature must be readily accessible. It is, therefore, a mistake to arrange them in such a manner that one stands in the way of the other, as, for instance, would result from placing tent, table and stove in a straight line. The best arrangement is that of the square or of the diamond, in which each feature is easily reached from any other.

Ample moving space is needed around the table and the stove. They should not be crowded in among trees or other obstructions. In the case of the tent, only the front need be freely accessible. The sides and the back are

not used for travel, and may be fitted closely into groups of trees without inconvenience. The parking spur is clearly outlined. Travel is confined to the side towards the camp itself. The other sides may be disregarded, as far as walking and moving about of the campers are concerned.

OUTLINING THE INDIVIDUAL CAMPSITE

The camper has the legitimate wish to feel secure in the possession of his temporary home. On the other hand, he must not transgress upon his neighbor's camp. Each camp must be so readily recognizable as a unit that there is no question as to boundary lines. Only in this way can overcrowding, disorder and conflict be avoided.

Where ample natural screening is still on the ground there should arise no difficulty as to the definiteness of outline. Each camp centers around the parking spur and cook stove. Table and tent will never be far removed from these two. But not all camps are in this favorable condition. Heavy use in the past may have done away with screening shrubs and young timber, or a misled sense of neatness may have led to their destruction by man, so that only larger trees, from pole size upwards, are left. In such cases the gaps may be partly filled by sparingly placing heavy boulders or short pieces of a large log in line with the supposed campsite boundary. This will not, and it should not, provide for a solid outline. It should merely indicate, more by suggestion than by actual fact, where the boundary of the campsite is supposed to run. Where the gaps are too wide or too difficult to fill, the application of an horizontal dash of paint, about two by four inches, on the trunks of the trees forming the outline will suggest rather than emphasize the size of the camp. The dashes may be placed about five or six feet from the ground. Loud and garish colors should be avoided. Adjoining camps may be given different distinguishing colors. Whatever means are chosen, the great danger lies in overdoing and overemphasizing rather than in suggesting. The best boundary will always be the natural one. Small groups of trees or tall shrubs, in fact, anything that sets off the camp against its surroundings, serve best.

THE PARKING SPUR

The parking spur does not necessarily have to be just long enough for the car. Frequently it will be advisable to let it run more deeply into the campsite, always provided that it permits the car to back out. The only condition is that under no circumstances must the car be allowed to turn within its spur. The rapidly increasing use of trailer and of lean-to tents erected alongside of the car may be met, when there is room, by broadening the end of the spur sufficiently to allow for these accessories, as long as the car itself cannot be turned. The obstacles used must be so large and so solidly fixed in the

ground that the driver will not even attempt to make a turn.

Most campers legitimately object to exposing their car unprotected to the hot sun, and wherever possible the parking spur should be placed so that it is shaded, at least during the middle of the day. Where tree shade is scanty, however, it is more important to reserve it for those parts of the campsite where the people actually live, in particular for the cooking fireplace and for the dinner table.

Equally important with the protection of the car against the broiling sun is protection against smoke from the fire. The car should never stand too close to the fire, and a study of the prevailing morning and evening winds will be helpful in preventing the mistake of placing the car spur in the lee of the cooking smoke.

COOKING FIRES AND CAMP FIRES

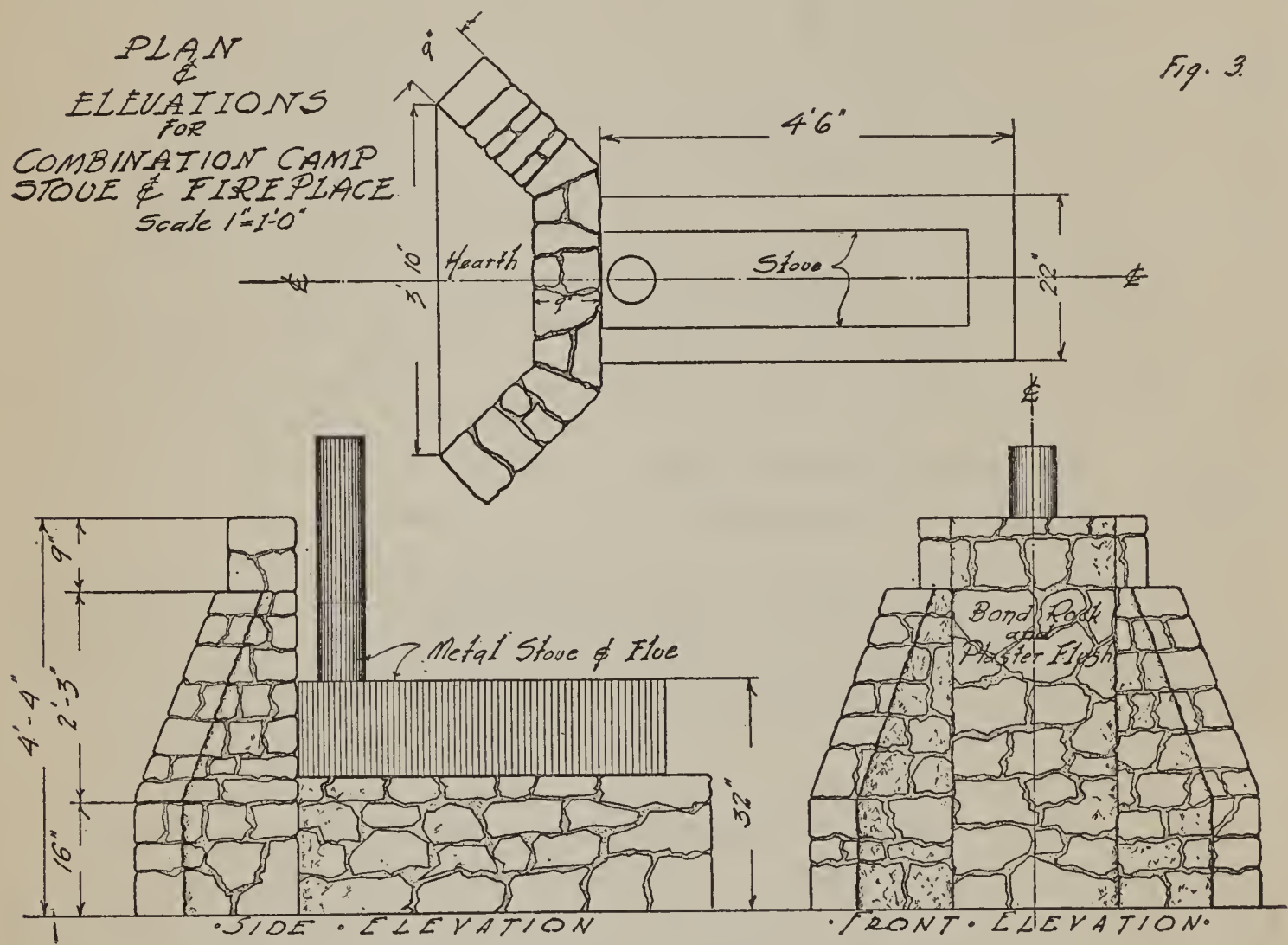
The objective of regulating the use of fires in camp is the protection of the green trees and shrubs. The danger from open fires built on the ground is threefold. The flame may actually ignite the vegetation and cause serious destruction. It may scorch the bark of near-by trees or burn and kill overhanging branches. Finally the heap of ashes left is leached out by rains and the resulting concentrated lye injures the roots in the ground. The open fire has, therefore, no place in the regulated and protected camp ground. In modern camps a cooking stove or grate is provided, raised on a solid concrete or rock foundation, and no fire may be built except on these foundations. The correct choice of their location is of great importance, since in case of error the heavy structures can be moved only at considerable expense.

There is danger of scorching from these improvised stoves, and it is advisable to place the cooking fire not closer than about eight feet from the nearest tree, and to lop off any overhanging branches that may be endangered. The direction of the prevailing winds matters greatly. It is essential to remember that, at least in the mountains during normal weather, the direction of the evening wind is opposite to that of the morning wind.

An increasing number of campers carry gasoline stoves in their outfits. The types of cook stoves and foundations usually furnished in camps are poorly suited for setting up the gasoline stove, which is more often placed inconveniently on the ground or on the table. A stout lateral extension built onto the table may be suggested for the accommodation of the gasoline stove.

Many campers like to gather around a campfire when the sun goes down and the cool night sets in. The old type of open campfire is not only the most wasteful form of heating systems, but it is highly objectionable from

the angle of camp protection. In large camp grounds it is undoubtedly preferable to provide a central community campfire, so located in an open space that no danger to trees and shrubs is to be feared. There will still be a number of campers, especially in small camp grounds, who prefer the privacy of their own campfire. Under no circumstances should they be allowed to build a fire on a place of their own choosing. The best solution of the problem may be to build, onto the stovepipe end of the foundation, a small fireplace with short, sloping wings and raised back for better draught, made of re-enforced concrete or, preferably, of rocks. (Fig. 3.) Concrete easily cracks



and disintegrates in winter frosts and also from the intense heat of the fire. Old-fashioned mortar may be preferable when the use of fireclay entails too great an expense. If the orientation of the cook stove with regard to the evening winds is such that the smoke from the suggested type of fireplace makes its use inconvenient, a variant may be employed in which the opening of the fireplace is at an angle of 45 degrees to the length axis of the stove. This fireplace is a simple rectangle, one side of which is formed by the narrow side of the cook stove foundation, while the other is a prolongation of one of its long sides. (Fig. 4.)

Obstructions and barriers have a deterring and directing effect only when they are immediately noticed by the driver. When a tourist arrives in camp his car is moving, and he must decide on the spur of the moment and in a fraction of a second which way to guide his car in order to avoid any damage to it. Obstacles and barriers must, therefore, be of such a nature that there is never a moment's hesitation on the part of the driver, and that he immediately reacts to the directions as expressed by the placing of obstacles. Small rocks are too easily overlooked by the driver of the moving car. They do not look dangerous, and they are too easily moved. Logs of small diameter offer no obstruction at all, and their use is a waste of effort and expenditure.

The size of rocks and logs to be employed is determined by the deterrent effect they produce upon the driver. Rocks should be partially embedded in the soil. They appear more natural and more solid than rocks placed merely on the surface. The size of the visible part of the rock is reduced by embedding, and this decrease in deterring mass must be taken into consideration in the choice of the rock employed. The color and visibility of the rock is important. In the open, against a light-colored soil, a reddish or blackish rock will stand out more strongly than a white boulder. Light-colored rocks show best against a darker or green background. It is always best to create a contrast between the rock and its surroundings. A sharp-edged rock has a stronger deterrent value than a smooth or rounded one, and should preferably be employed where strong protection is desired, for instance at the base of endangered trees. On the other hand, there can be no justification for the use of obstacles which introduce serious risk to the car beyond that currently encountered in mountain driving.

It is neither necessary nor desirable to outline roads or spurs with rows of regularly spaced rocks. The object is not at all to make the camp look pretty, but exclusively to insure order, to restrict the movement of the car to definite lanes and to protect the vegetation in the forest. Regular rows look unnatural. The rocks need not be placed more closely than the width of a car, just so far apart that no driver will attempt to go through between them. For this purpose a few well-placed large boulders will serve far better than a lot of smaller rocks. The spacing of the boulders should neither be regular nor should they be placed in a straight line; in fact, the more natural the arrangement of the rocks can be made to appear the better will the character of an area as a campsite be preserved. When people go camping they want nature as unspoiled as possible. No one would camp in a city garden with neat borders of whitewashed small rocks along the paths. The object of improving a camp ground is certainly not to embellish it, but to introduce just that degree of order which is necessary to make a camp ground permanent,

safe and pleasant, and no more.

The use of logs to serve as barriers and guides along roads and parking spurs is, in general, much cheaper than the hauling and digging in of boulders. In our wild forests the ground is often strewn with down trees which can be used for this purpose. On the other hand, logs and pole fences are far less permanent. Large logs lying on the ground will act as barriers for a long time, even if they decay, but a large part of the campers will try to get their firewood from these conveniently placed sources, and no "forbidden" signs will stop them. A simple method will effectually take care of this nuisance. It is recommended to drive a number of the corrugated fasteners, which are commonly used to hold the mitre in doors or to fasten the corners of boxes, into the parts of the log which will be most likely to be attacked by the axeman. The lesson will be quickly learned.

When wood is used for barriers the plain, natural log, placed in such a way that it gives the appearance of having fallen where it lies, is without doubt much preferable to the artificial fence. The latter may be useful in helping out, especially in picnic grounds under heavy use when the character of the area approaches that of a city park. In the wilder regions it is plainly out of place. The fence should be kept as simple as possible. Plain poles on low posts are both serviceable and more in keeping with their surroundings than are higher and more elaborate fences. Where vandalism develops, a number of the corrugated fasteners hammered in flush will soon stop the nuisance.

Cedar logs are far more durable than pine. Fir is the least to be recommended. Creosoting, at least on the under side of the log where it is in contact with the ground, may prolong the life of the log.

When logs are used at all they must be substantial. The outlining of a parking spur or road with poles and tops of young trees may serve temporarily, but within a very short time they will have to be replaced. The driver will surely not hesitate to run over a pole if he so desires. In particular should the end log of a parking spur be heavy and of large diameter.

An infallible check on whether roads and parking spurs are correctly laid out, and whether the choice and emplacement of obstacles is adequate or not, consists in trying out every road and every parking spur by driving a car over and into them, just as the visiting campers will do. Any mistake or error in judgment will promptly appear, and may then be corrected before it is too late. The proof of the fitness of a camp ground for use is the automatic and effortless reaction of the camper to the improvements made for his benefit.

To a minor degree rocks or logs will be used for the purpose of defining the outlines of the individual camps and of small patches of green which are not needed for camping, and which add to the general attractiveness of the camp. For these purposes the rocks or logs are not really obstructions, but if placed correctly, with regard to the reaction they produce in the minds of the campers, they will aid in regulating the circulation of the campers within the grounds. If placed at random, no good service will be served. The rock or log must convey a message to the camper. There is always one definite position for either, which is best, and all others are meaningless. Man does not see objects singly, but always in relation to others near by. This distance varies with the size and conspicuousness of the objects. A space is called open when the objects are so far distant from each other that this relation is not established. The task of filling an open space consists in placing a conspicuous object in such a position that a relation is established between it and its nearest neighbors, to right and left, so that, for instance, trees which were too far from each other to be seen in conjunction are now brought together by the introduction of another body, such as a boulder or a log. This tying together is the only objective of introducing material from the outside, and the simpler the means employed the better is the result. One large rock serves the purpose far better than several smaller ones.

The protection of trees, especially along roads and at the entrance to the parking spurs, demands special attention. Carelessly driven cars often side-swipe trees, tearing off the bark and producing more or less serious injuries, the repetition of which may lead to death. Obviously, trees at sharp corners and at the outside of the road curve are most endangered, and these will have to be protected by placing large rocks in such a position that the driver will automatically avoid them in self-defense. Here, also, there is generally but one way of placing them correctly, both from the point of view of protection offered to the trees and from that of safety to the automobile. Small rocks are hardly seen against the tree, and logs can rarely be used for this purpose. The rocks must be firmly embedded in the ground.

Trees at the entrance to the parking spurs are particularly endangered, first from the car turning into the spur, and then again from the car backing out, so that such trees are in need of protection from both sides.

TIDYING THE CAMPSITE

On an old, much-used camp ground the original vegetation, with exception of the older trees, is generally so far gone that there is little left to remove. Even dead branches and twigs have, as a rule, long since found their way to the cooking fire. Cleaning up will mostly be confined to the obliteration of old fireplaces and to the removal of ash heaps, both visible and

buried. But in newly planned camps, with more luxuriant vegetation, space will often have to be cleared for the parking spur, the stove, the table and the tent. The tendency will rather be to go too far in clearing. No living shrub or tree should be removed that is not plainly in the way, and all such vegetation which acts as a screen from neighboring camps must be strictly preserved. Branches overhanging the stove or the parking spur should, however, be removed, and dead branches, in so far as they may constitute a fire risk, should be trimmed off throughout the camp.

In certain regions the fireproofing may have to go further. Sagebrush is highly inflammable and should be eradicated to a distance well away from any source of fire. In other camps the vegetation on the ground, for instance, luxuriantly growing ferns, is green, and therefore safe in spring, but dries up later in the year, and then constitutes a serious fire menace.

In general, the rule prevails that the best campsite is one which shows least interference with natural conditions. The mistake is often made of raking off all litter, leaves and needles from the ground. This cover of litter is essential for the maintenance of normal conditions in the soil, and consequently for the healthy growth of the trees. Its removal is not only prejudicial to the vegetation but exposes the raw soil and makes the camp dusty and dirty.

Another common mistake is that of removing all down trees and logs, and even rocks. There is no question but that these should be taken out wherever they plainly interfere with camp life; but a well-placed rock or log affords not only a convenient seat, but it may contribute materially to the natural aspect of the woods camp. An old log overgrown with green moss is an asset in the landscape, a thing of beauty, and therefore to be protected.

BEAUTY IN THE CAMP

Strict and narrow adherence to the principles set forth will cover every foot of land with campsites, and in many cases, where use is excessive, this is the only treatment the camp ground can be given. But it is important to remember that a camp ground is primarily meant to offer pleasant surroundings, with an abundance of green trees and shrubs in natural distribution, shady and intimate. Generally, the breaking up of an area into sites will leave some unused or unusable spots, open spaces covered with a tangle of vegetation, small patches and groups of reproduction, or picturesque outcrops of rock with some green. They are the "pictures on the wall," the decorative element that tends to break the monotony and adds to the feeling of living in the woods, away from the restrictions of civilization.

Many camp grounds lie along brooks, creeks or rivers. The public's ten-

dency to crowd down to running water is undesirable from the point of view of sanitation. Aside from this consideration, there are often particularly beautiful spots along the creek, little waterfalls, small islands, rocks and rich vegetation which really belong to the whole camping community, and should be kept out of the site-planning scheme and reserved for common enjoyment.

PLANTING

Planting will undoubtedly often be necessary to help out the natural vegetation in these beauty spots as well as for filling gaps in screening from camp to camp and for raising barriers against the highway. The use of small nursery stock will rarely be advisable, except in very well-protected places and in the building up of camp ground areas against future use. The cost of transportation of larger plants from a distance is prohibitive. But there will always be young trees or shrubs available in the forest near by. With careful balling and the usual precautions in transfer and planting, these native young trees and shrubs, grown under the same climatic conditions, will have the best chance to survive. As for their placing, the same rule should be followed that governs the distribution of obstacles. They should be planted only where needed. There is one essential difference, however, between the two. Trees will grow, and the effect of the planting within a few years will be an entirely different one from what it is in the beginning. Intelligent planting, therefore, makes high demands on imagination. The landscape gardener must visualize the ultimate effect of his planting as it will appear in the future. The final proof of good planting comes to light only after ten or twenty years have elapsed. In this connection it is essential to give close consideration to the character of the plants to be used. The difference in the rate of growth, in growth form, in color and in mass effects of the crown, may in time produce a picture quite different from that intended at the moment of planting. Slow-growing plants will soon be completely shaded out by more vigorous species. The slender spire of one tree may be crowded out by the broad crown of its neighbor. Differences in soil moisture between the original site of the transplanted tree and its new location may accelerate or retard its growth. Certain species stand transplanting much better than others, and the time of the year at which the operation is undertaken has a pronounced influence on success or failure.

It goes without saying that plants which are foreign to the native vegetation are entirely out of place. Even if they adapt themselves to their new site they will always be felt as strangers in the native plant community and will detract from the natural beauty of the landscape.

PLAYGROUNDS

In every large camp ground there is a demand for some open space to

serve as playground for children and young people. Not in all camp grounds can this demand be satisfied, but often enough there is some open space available, bare or covered with low brush, unfit for camping, but excellent for the purpose. It is far better, in the long run, to include these in the scheme of subdivision and to clear them of vegetation than to let the campers and children slowly and far more destructively whittle playgrounds out of the green growth. These playgrounds should, if possible, be located at some distance from the campsites, so that the campers are not unduly annoyed by the inevitable noise and dust. Small playgrounds may be scattered throughout the camp ground for the use of smaller children. The dust nuisance on playgrounds, which is particularly objectionable in Western camps, may be abated by the application of river gravel or other suitable material found in the immediate vicinity.

CONSECUTIVE STEPS IN CAMP PLANNING

The first step in camp planning is the determination of the standard size of the individual plots, taking into account the space needed for screening the lot against the neighboring ones and against the road. The standard size varies in different camp grounds, according to the intensity of use, topography and density of tree growth. Each lot must be provided with its parking spur, the cooking stove, and room for tables and tent. There must be sufficient space to allow the campers to move about without undue crowding. Each lot must be directly accessible by road. On this basis the camp ground is roughly subdivided, and a tentative road system is laid out, with due regard to the position of, and distance to, comfort stations and garbage disposal facilities. Road plan and camp ground subdivision are mutually interdependent, but the road invariably must serve the campsites. The only other restrictive features in road planning are unfavorable topography or else fine groups and specimens of trees which must be preserved in the interest of camp beauty.

Once the rough plan has been decided upon, the work of elaboration and refinement begins. Each campsite must possess certain qualities. It must offer shade and protection from winds. There must be sufficient level ground to place a cooking stove, tent, table and parking spur. Its position relative to adjacent lots, and the assurance of privacy against neighbors and road, is important.

Parking spur and cook stove, the main fixed features, stand in close relation to each other, and cannot be located independently. The emplacement of the cook stove influences that of the parking spur. They must be near each other and still not so close that smoke and heat can injure the car. The cook stove should stand in the open, and in afternoon shade.

When parking spur and cook stove have found their definite place, the table and tent can easily be fitted into the picture.

The completed campsite must be immediately serviceable to the camper, and the criterion of usefulness is the unconscious and natural ease with which he avails himself of the convenience offered, in the same way as he does in entering a hotel room. No better check can be made, after the campsites have been laid out, than by going through the motions of every-day camp life, by driving into the parking spur and backing out again, by carrying bedding and provisions into camp, and by serving an imaginary meal from the camp stove.

The final proof lies in the comfort of the camper and in the effective protection of plant life, which gives its distinctive character to the camp.

